

SECTION 6.3

ARCHITECTURAL COATINGS

(Revised October 2003)

EMISSION INVENTORY SOURCE CATEGORY

Solvent Evaporation / Architectural Coatings and Related Processes

EMISSION INVENTORY CODES (CES CODES) AND DESCRIPTION

520-520-91##-0000 (28 codes) Oil-Based Coatings

520-520-92##-0000 (27 codes) Water-Based Coatings

520-522-8300-0000 (46771) Cleanup & Thinning Solvents

METHODS AND SOURCES

The methodology described below is used to estimate emissions of total organic gases (TOG) and reactive organic gases (ROG) resulting from the use of **oil-based** and **water-based** architectural and industrial maintenance coatings and the associated use of **cleanup and thinning solvents**. Only the non-aerosol types of architectural and industrial maintenance coatings are included. Aerosol coatings are covered under the Consumer Products category.

Architectural coatings are coatings applied to stationary structures and their accessories, to mobile homes, pavements, or curbs. Industrial maintenance coatings are high performance coatings formulated for and applied to substrates in industrial, commercial, or institutional situations exposed to extreme environmental conditions (e.g., immersion in water, chronic exposure to corrosive agents, repeated heavy abrasion).

Annual average emission estimates of TOG and ROG for the year 2000 were derived from data obtained through a survey of manufacturers of architectural and industrial maintenance coatings conducted by the Stationary Source Division of the Air Resources Board in 2001.¹

The results of the survey showed that about 98 million gallons of coatings were sold in California in 2000. **Oil-based** coatings (28 different types) accounted for 17% of the sales, while **Water-based** coatings (27 different types) accounted for 83% of the sales.

For each coating category, TOG emissions were estimated by dividing VOC emissions listed in the survey report¹ by the Fraction of Reactive Organic Gases (FROG) derived from chemical composition data obtained from the survey. The statewide average emission factors were then derived by dividing the total statewide amount of TOG emissions by the statewide sales data listed in the survey report.¹

TOG emissions from **cleanup and thinning solvents** were estimated based on the assumption that 1 pint of solvent (with a TOG emission factor of 6,400 pounds per 1,000 gallons) is used per gallon of oil-based coating.² ROG emissions are estimated by multiplying the TOG emissions by the appropriate Fraction of Reactive Organic Gases.³

Statewide TOG emissions, broken down by coating type, are summarized in Tables I and II. These tables list the EIC and CES codes, category descriptions, process rates, ROG emissions, TOG emissions, and the TOG emission factors. The ARB survey gathered data for 51 types of coatings. However, to protect the confidentiality of the respondents' data, the data in the survey report are only shown where the data are for three or more companies. Consequently, the data for coatings not representing at least three companies are combined into two "Other" categories: one for **water-based** paints and one for **oil-based** paints. Several other coatings with small volumes have also been moved to the "Other" categories. The types of coatings included in these "Other" categories are listed in Table III.

The amounts of coatings sold in the state were apportioned to the counties using population. In Table IV, process rate and ROG emissions data for total oil-based paints, total water-based paints, and from cleanup and thinning solvents are listed for all counties.

ASSUMPTIONS

1. The 2000 emissions from the use of architectural coatings in California can be estimated from data found in the 2001 survey report.¹
2. The amount of coatings sold is equal to the amount used.
3. Paint cleanup and thinning solvents are used at the rate of one pint per gallon of oil-based coating.²
4. Paint cleanup and thinning solvents have a density of 770 g/l.² This is equivalent to 6.4 pounds per gallon (or 6,400 pounds per 1,000 gallons).
5. Statewide architectural coatings usage can be apportioned to the counties using population.

CHANGES IN METHODOLOGY

The 1996 emission inventory was based on 1996 sales and VOC emissions data obtained through a 1998 survey of architectural coatings manufacturers conducted by the Air Resources Board. The 2000 inventory is based on 2000 sales and emissions data obtained from a 2001 survey also conducted by the Air Resources Board. Some coating categories from the 1998 survey have been combined with other categories for the 2001 survey.

COMMENTS AND RECOMMENDATIONS

Information on the use of cleanup and thinning solvents was not collected in the latest survey. However, information will be obtained as part of a study currently underway. The types of information being gathered include the specific types and amounts of solvents used, density and emission factors.

DIFFERENCES BETWEEN 2000 AND 1996 EMISSION ESTIMATES

The 2000 ROG emissions from these categories are 10 percent higher than the 1996 emissions. Emissions from the use of water-based coatings increased by 18 percent, while emissions from the use of oil-based coatings increased by 5 percent. Sales of oil-based coatings increased by 8 percent. Sales of water-based coatings increased by 14 percent. The ratio of water-based coatings sales over oil-based coatings sales is 4.8 for 2000 in contrast to 4.57 for 1996.

TEMPORAL ACTIVITY

The application of architectural coatings is assumed to be highest during the summer and lowest in the winter. The weekly activity occurs primarily during weekdays. The daily activity occurs primarily during daylight hours.

REFERENCES

1. California Environmental Protection Agency, Air Resources Board, 2001 Architectural Coatings Survey - Final Report (October 2003).
2. Air Resources Board, Methods for Assessing Area Source Emissions in California (December 1984).
3. California Environmental Protection Agency, Air Resources Board, Improvement of Speciation Profiles for Architectural and Industrial Maintenance Coating Operations, Contract No. 93-319 (June 1996).

PREPARED BY

Andy Delao
October 2003

TABLE I
SOLVENT-BORNE COATINGS AND THINNING/CLEANUP SOLVENTS
2000 STATEWIDE EMISSIONS

ARB 2001 Architectural Coating Survey Summary (as of 09/12/03)							
EIC	CES	Coating Category	Sales (gals)	Process Rate (1000 gal)	ROG Emissions (TPY)	TOG Emissions (TPY)*	TOG Emission Factor (lbs/1000 gal)
520,520,9164,0000	85571	Bituminous Roof	1,608,033	1,608.033	1,570.2	1,629.8	2,027.04
520,520,9109,0000	89771	Bituminous Roof Primer	69,993	69.993	114.0	118.4	3,381.82
520,520,9165,0000	85589	Concrete Curing Compounds	32,395	32.395	29.8	30.9	1,909.06
520,520,9166,0000	85597	Dry Fog	243,047	243.047	310.7	322.5	2,653.66
520,520,9122,0000	89789	Faux Finishing	6,948	6.948	11.7	12.1	3,490.98
520,520,9159,0000	85530	Flat	11,952	11.952	18.4	19.1	3,192.58
520,520,9169,0000	85621	Floor	149,939	149.939	86.5	89.8	1,197.87
520,520,9170,0000	85639	Form Release Compounds	223,634	223.634	221.0	229.4	2,051.68
520,520,9172,0000	85654	Industrial Maintenance	4,126,134	4,126.134	5,406.8	5,611.9	2,720.20
520,520,9157,0000	89797	Lacquers	374,503	374.503	876.0	909.2	4,855.58
520,520,9124,0000	89813	Mastic Texture	210,143	210.143	165.2	171.5	1,632.13
520,520,9173,0000	85662	Metallic Pigmented	513,541	513.541	1,003.2	1,041.3	4,055.28
520,520,9160,0000	89821	Nonflat - Low Gloss/Medium Gloss	591,699	591.699	810.2	841.0	2,842.59
520,520,9161,0000	85548	Nonflat - High Gloss	596,788	596.788	832.9	864.5	2,897.17
520,520,9100,0000	46763	Other Coatings	309,258	309.258	630.0	653.9	4,228.64
520,520,9105,0000	85399	Primer, Sealer, and Undercoater	1,369,924	1,369.924	1,886.1	1,957.7	2,858.13
520,520,9153,0000	85506	Quick Dry Enamel	607,372	607.372	901.7	935.9	3,081.72
520,520,9106,0000	85407	Quick Dry Primer, Sealer, and Undercoater	1,259,524	1,259.524	2,270.5	2,356.7	3,742.22
520,520,9174,0000	85670	Roof	89,448	89.448	77.9	80.9	1,808.84
520,520,9126,0000	89839	Rust Preventative	166,748	166.748	263.4	273.4	3,279.10
520,520,9108,0000	89847	Specialty Primer, Sealer, and Undercoater	21,461	21.461	35.8	37.2	3,462.25
520,520,9131,0000	89854	Stains - Clear/Semitransparent	1,690,513	1,690.513	2,724.6	2,828.0	3,345.76
520,520,9136,0000	85472	Stains - Opaque	224,925	224.925	309.5	321.2	2,856.10
520,520,9176,0000	85696	Traffic Marking	799,677	799.677	273.4	283.8	709.84
520,520,9141,0000	89862	Varnishes - Clear/Semitransparent	773,417	773.417	1,392.5	1,445.3	3,737.50
520,520,9113,0000	89870	Waterproofing Sealers	442,989	442.989	601.1	623.9	2,816.72
520,520,9118,0000	89888	Waterproofing Concrete/Masonry Sealers	225,227	225.227	373.5	387.7	3,442.91
520,520,9177,0000	89896	Wood Preservatives	166,982	166.982	247.6	257.0	3,077.99
		Total Solvent-Borne Coatings	16,906,211	16,906.211	23,444.2	24,333.9	
520,522,8300,0000	46771	Thinning and Cleanup Solvents**	2,113,276	2,113.276	6,527.1	6,762.5	6400.00

* TOG emissions = ROG emissions / FROG; FROG = 0.963437 (rev. 10/03)

** Assume 1 pint (or 0.125 gal) of thinning/cleanup solvent per gallon of solvent-borne coatings; FROG = 0.9652

**TABLE II
WATER-BORNE COATINGS
2000 STATEWIDE EMISSIONS**

ARB 2001 Architectural Coating Survey Summary (as of 09/12/03)							
EIC	CES	Coating Category	Sales (gals)	Process Rate (1000 gal)	ROG Emissions (TPY)	TOG Emissions (TPY)*	TOG Emission Factor (lbs/1000 gal)
520,520,9264,0000	85894	Bituminous Roof	1,637,364	1,637.364	9.1	9.1	11.15
520,520,9209,0000	89904	Bituminous Roof Primer	100,527	100.527	19.3	19.3	384.13
520,520,9265,0000	85902	Concrete Curing Compounds	660,024	660.024	105.6	105.6	319.92
520,520,9266,0000	85910	Dry Fog	216,709	216.709	89.6	89.6	827.35
520,520,9222,0000	89912	Faux Finishing	166,789	166.789	66.9	66.9	802.63
520,520,9259,0000	85852	Flat	34,798,306	34,798.306	5,674.1	5,674.3	326.13
520,520,9269,0000	85936	Floor	1,275,125	1,275.125	231.6	231.6	363.27
520,520,9223,0000	89920	Form Release Compounds	32,090	32.090	1.8	1.8	114.70
520,520,9272,0000	85944	Industrial Maintenance	613,946	613.946	230.6	230.6	751.11
520,520,9257,0000	89938	Lacquers	72,849	72.849	36.3	36.3	997.49
520,520,9224,0000	89946	Mastic Texture	418,447	418.447	82.4	82.4	393.79
520,520,9273,0000	85951	Metallic Pigmented	112,402	112.402	23.7	23.7	422.04
520,520,9260,0000	89953	Nonflat - Low Gloss/Medium Gloss	24,105,930	24,105.930	6,355.4	6,355.6	527.31
520,520,9261,0000	85860	Nonflat - High Gloss	1,329,648	1,329.648	499.2	499.2	750.87
520,520,9200,0000	46755	Other Coatings	1,756,375	1,756.375	79.6	79.6	90.64
520,520,9205,0000	85720	Primer, Sealer, and Undercoater	6,755,899	6,755.899	1,234.0	1,234.0	365.32
520,520,9206,0000	85738	Quick Dry Primer, Sealer, and Undercoater	400,703	400.703	96.7	96.7	482.61
520,520,9274,0000	85969	Roof	1,047,906	1,047.906	131.3	131.3	250.66
520,520,9226,0000	89961	Rust Preventative	43,151	43.151	10.2	10.2	473.43
520,520,9208,0000	89979	Specialty Primer, Sealer, and Undercoater	355,060	355.060	76.3	76.3	429.58
520,520,9231,0000	89987	Stains - Clear/Semitransparent	481,082	481.082	145.6	145.6	605.28
520,520,9236,0000	85803	Stains - Opaque	862,448	862.448	188.1	188.1	436.11
520,520,9276,0000	85977	Traffic Marking	2,539,241	2,539.241	834.2	834.3	657.10
520,520,9241,0000	89995	Varnishes - Clear/Semitransparent	375,948	375.948	185.7	185.8	988.17
520,520,9213,0000	90001	Waterproofing Sealers	574,622	574.622	98.0	98.0	341.25
520,520,9218,0000	90019	Waterproofing Concrete/Masonry Sealers	482,694	482.694	100.5	100.5	416.42
520,520,9277,0000	90027	Wood Preservatives	10,462	10.462	1.8	1.8	346.25
Total Water-Borne Coatings			81,225,745	81,225.745	16,607.8	16,608.3	

* TOG emissions = ROG emissions / FROG; FROG = 0.999966 (rev. 10/03)

**TABLE III
OTHER COATINGS**

ARB 2001 Architectural Coating Survey Summary (as of 09/12/03)							
Category Code	Coating Category	Total Sales (gals)	SB Sales (gals)	WB Sales (gals)	SB Ems (ROG tpy)	WB Ems (ROG tpy)	Total Ems (ROG tpy)
1	Antenna	PD	PD	PD	0.5	0.0	0.6
6	Clear Brushing Lacquer	PD	PD	0	192.8	0.0	192.8
10	Fire Resistive	PD	0	PD	0.0	0.1	0.1
11	Fire Retardant - Clear	PD	0	PD	0.0	0.0	0.0
12	Fire Retardant - Opaque	PD	PD	26,690	2.5	3.7	6.2
15	Flow	PD	0	PD	0.0	0.5	0.5
18	High Temperature	PD	18,621	PD	29.7	0.0	29.7
22	Magnesite Cement	PD	PD	0	42.1	0.0	42.1
25	Multi-Color	PD	PD	7,517	0.1	2.6	2.7
31	Quick Dry Enamel (WB only)	PD		PD		7.4	7.4
37	Shellacs - Clear	PD	PD	0	38.6	0.0	38.6
38	Shellacs - Opaque	PD	PD	0	183.5	0.0	183.5
	SUBTOTALS:	280,658	227,316	53,342	490.0	14.4	504.3
5	Bond Breakers	93,896	0	93,896	0.0	25.0	25.0
17	Graphic Arts	26,389	13,667	12,722	23.5	2.8	26.3
21	Low Solids	13,413	0	13,413	0.0	3.3	3.3
29	Pre-Treatment Wash Primer	75,342	4,188	71,154	8.5	27.9	36.4
36	Sanding Sealers	28,268	20,452	7,816	47.4	2.6	50.0
42	Swimming Pool	22,086	12,399	9,687	16.6	3.7	20.2
43	Swimming Pool Repair and Maintenance	15,266	15,266	0	36.3	0.0	36.3
51	Other*	1,510,316	15,971	1,494,345	7.6	0.1	7.7
	SUBTOTALS:	1,784,976	81,943	1,703,033	140.0	65.2	205.2
	TOTAL OTHER COATINGS	2,065,633	309,258	1,756,375	630.0	79.6	709.6

* The "Other" category consists primarily of bituminous driveway sealer emulsions that have zero grams per liter of VOCs.

PD = Protected Data

TABLE IV
2000 ARCHITECTURAL COATINGS EMISSIONS - COUNTY SUMMARY

co	ab	dis	county	2000 Pop.	% of total pop.	Solvent-Borne Coatings (28 EICs)		Water-Borne Coatings (27 EICs)		Thinners/Cleanup	
						Process Rate (1000 gal)	ROG Ems (TPY)	Process Rate (1000 gal)	ROG Ems (TPY)	Process Rate (1000 gal)	ROG Ems (TPY)
2	GBV	GBU	Alpine	1,200	0.004%	0.596	0.8	2.863	0.6	0.074	0.2
14	GBV	GBU	Inyo	18,200	0.053%	9.039	12.5	43.429	8.9	1.130	3.5
26	GBV	GBU	Mono	12,900	0.038%	6.407	8.9	30.782	6.3	0.801	2.5
	GBV Total			32,300	0.095%	16.042	22.2	77.074	15.8	2.005	6.2
17	LC	LAK	Lake	58,800	0.173%	29.204	40.5	140.308	28.7	3.650	11.3
	LC Total			58,800	0.173%	29.204	40.5	140.308	28.7	3.650	11.3
9	LT	ED	El Dorado (partial)	34,500	0.101%	17.135	23.8	82.324	16.8	2.142	6.6
31	LT	PLA	Placer (partial)	12,200	0.036%	6.059	8.4	29.112	6.0	0.757	2.3
	LT Total			46,700	0.137%	23.194	32.2	111.435	22.8	2.899	9.0
3	MC	AMA	Amador	35,400	0.104%	17.582	24.4	84.471	17.3	2.198	6.8
5	MC	CAL	Calaveras	40,850	0.120%	20.289	28.1	97.476	19.9	2.536	7.8
9	MC	ED	El Dorado (partial)	124,000	0.364%	61.586	85.4	295.888	60.5	7.698	23.8
22	MC	MPA	Mariposa	17,150	0.050%	8.518	11.8	40.923	8.4	1.065	3.3
29	MC	NSI	Nevada	92,400	0.271%	45.891	63.6	220.485	45.1	5.736	17.7
31	MC	PLA	Placer (partial)	22,200	0.065%	11.026	15.3	52.974	10.8	1.378	4.3
32	MC	NSI	Plumas	20,800	0.061%	10.331	14.3	49.633	10.1	1.291	4.0
46	MC	NSI	Sierra	3,610	0.011%	1.793	2.5	8.614	1.8	0.224	0.7
55	MC	TUO	Tuolumne	54,900	0.161%	27.267	37.8	131.002	26.8	3.408	10.5
	MC Total			411,310	1.208%	204.281	283.3	981.467	200.7	25.535	78.9
15	MD	KER	Kern (partial)	112,600	0.331%	55.924	77.6	268.686	54.9	6.990	21.6
19	MD	AV	Los Angeles (partial)	300,200	0.882%	149.097	206.8	716.336	146.5	18.637	57.6
33	MD	MOJ	Riverside (partial)	16,500	0.048%	8.195	11.4	39.372	8.1	1.024	3.2
33	MD	SC	Riverside (partial)	9,300	0.027%	4.619	6.4	22.192	4.5	0.577	1.8
36	MD	MOJ	San Bernardino (partial)	382,300	1.123%	189.873	263.3	912.243	186.5	23.734	73.3
	MD Total			820,900	2.412%	407.708	565.4	1,958.829	400.5	50.963	157.4
8	NC	NCU	Del Norte	27,600	0.081%	13.708	19.0	65.859	13.5	1.713	5.3
12	NC	NCU	Humboldt	127,100	0.373%	63.125	87.5	303.286	62.0	7.891	24.4
23	NC	MEN	Mendocino	86,800	0.255%	43.110	59.8	207.122	42.3	5.389	16.6
49	NC	NS	Sonoma (partial)	57,100	0.168%	28.359	39.3	136.252	27.9	3.545	10.9
53	NC	NCU	Trinity	13,050	0.038%	6.481	9.0	31.140	6.4	0.810	2.5
	NC Total			311,650	0.916%	154.784	214.6	743.658	152.1	19.348	59.8
27	NCC	MBU	Monterey	403,500	1.185%	200.402	277.9	962.830	196.9	25.050	77.4
35	NCC	MBU	San Benito	53,700	0.158%	26.671	37.0	128.139	26.2	3.334	10.3
44	NCC	MBU	Santa Cruz	256,800	0.754%	127.542	176.9	612.775	125.3	15.943	49.2
	NCC Total			714,000	2.098%	354.615	491.8	1,703.745	348.4	44.327	136.9
18	NEP	LAS	Lassen	34,000	0.100%	16.886	23.4	81.131	16.6	2.111	6.5
25	NEP	MOD	Modoc	9,425	0.028%	4.681	6.5	22.490	4.6	0.585	1.8
47	NEP	SIS	Siskiyou	44,650	0.131%	22.176	30.8	106.544	21.8	2.772	8.6
	NEP Total			88,075	0.259%	43.743	60.7	210.164	43.0	5.468	16.9
19	SC	SC	Los Angeles (partial)	9,259,400	27.202%	4,598.770	6,377.2	22,094.751	4,517.6	574.846	1,775.5
30	SC	SC	Orange	2,854,000	8.384%	1,417.467	1,965.6	6,810.206	1,392.4	177.183	547.3
33	SC	SC	Riverside (partial)	1,202,600	3.533%	597.283	828.3	2,869.640	586.7	74.660	230.6
36	SC	SC	San Bernardino (partial)	1,337,400	3.929%	664.233	921.1	3,191.300	652.5	83.029	256.4
	SC Total			14,653,400	43.048%	7,277.752	10,092.2	34,965.896	7,149.3	909.719	2,809.8
40	SCC	SLO	San Luis Obispo	248,300	0.729%	123.321	171.0	592.493	121.1	15.415	47.6
42	SCC	SB	Santa Barbara	400,700	1.177%	199.012	276.0	956.149	195.5	24.876	76.8
56	SCC	VEN	Ventura	757,100	2.224%	376.021	521.4	1,806.590	369.4	47.003	145.2
	SCC Total			1,406,100	4.131%	698.353	968.4	3,355.231	686.0	87.294	269.6
37	SD	SD	San Diego	2,832,500	8.321%	1,406.788	1,950.8	6,758.902	1,382.0	175.849	543.1
	SD Total			2,832,500	8.321%	1,406.788	1,950.8	6,758.902	1,382.0	175.849	543.1
1	SF	BA	Alameda	1,451,100	4.263%	720.703	999.4	3,462.610	708.0	90.088	278.2
7	SF	BA	Contra Costa	954,400	2.804%	474.012	657.3	2,277.386	465.6	59.251	183.0
21	SF	BA	Marin	248,400	0.730%	123.370	171.1	592.731	121.2	15.421	47.6
28	SF	BA	Napa	124,900	0.367%	62.033	86.0	298.036	60.9	7.754	23.9
38	SF	BA	San Francisco	781,100	2.295%	387.941	538.0	1,863.858	381.1	48.493	149.8
41	SF	BA	San Mateo	710,400	2.087%	352.827	489.3	1,695.154	346.6	44.103	136.2
43	SF	BA	Santa Clara	1,691,100	4.968%	839.901	1,164.7	4,035.297	825.1	104.988	324.3
48	SF	BA	Solano (partial)	275,000	0.808%	136.581	189.4	656.204	134.2	17.073	52.7
49	SF	BA	Sonoma (partial)	404,200	1.187%	200.750	278.4	964.501	197.2	25.094	77.5
	SF Total			6,640,600	19.508%	3,298.118	4,573.6	15,845.778	3,239.9	412.265	1,273.3
10	SJV	SJU	Fresno	803,300	2.360%	398.967	553.3	1,916.832	391.9	49.871	154.0
15	SJV	SJU	Kern (partial)	552,000	1.622%	274.156	380.2	1,317.181	269.3	34.270	105.8
16	SJV	SJU	Kings	129,900	0.382%	64.516	89.5	309.967	63.4	8.065	24.9
20	SJV	SJU	Madera	124,300	0.365%	61.735	85.6	296.604	60.6	7.717	23.8
24	SJV	SJU	Merced	210,800	0.619%	104.696	145.2	503.010	102.8	13.087	40.4
39	SJV	SJU	San Joaquin	567,700	1.668%	281.954	391.0	1,354.644	277.0	35.244	108.9
50	SJV	SJU	Stanislaus	449,700	1.321%	223.348	309.7	1,073.073	219.4	27.918	86.2
54	SJV	SJU	Tulare	369,300	1.085%	183.416	254.3	881.222	180.2	22.927	70.8
	SJV Total			3,207,000	9.421%	1,592.787	2,208.8	7,652.533	1,564.7	199.098	614.9

TABLE IV
2000 ARCHITECTURAL COATINGS EMISSIONS - COUNTY SUMMARY

co	ab	dis	county	2000 Pop.	% of total pop.	Solvent-Borne Coatings (28 EICs)		Water-Borne Coatings (27 EICs)		Thinners/Cleanup	
						Process Rate (1000 gal)	ROG Ems (TPY)	Process Rate (1000 gal)	ROG Ems (TPY)	Process Rate (1000 gal)	ROG Ems (TPY)
13	SS	IMP	Imperial	143,600	0.422%	71.320	98.9	342.658	70.1	8.915	27.5
33	SS	SC	Riverside (partial)	325,200	0.955%	161.514	224.0	775.991	158.7	20.189	62.4
	SS Total			468,800	1.377%	232.834	322.9	1,118.649	228.7	29.104	89.9
4	SV	BUT	Butte	204,600	0.601%	101.617	140.9	488.216	99.8	12.702	39.2
6	SV	COL	Colusa	18,900	0.056%	9.387	13.0	45.099	9.2	1.173	3.6
11	SV	GLE	Glenn	26,700	0.078%	13.261	18.4	63.711	13.0	1.658	5.1
31	SV	PLA	Placer (partial)	215,000	0.632%	106.782	148.1	513.032	104.9	13.348	41.2
34	SV	SAC	Sacramento	1,230,400	3.615%	611.090	847.4	2,935.977	600.3	76.386	235.9
45	SV	SHA	Shasta	164,700	0.484%	81.800	113.4	393.007	80.4	10.225	31.6
48	SV	YS	Solano (partial)	121,700	0.358%	60.443	83.8	290.400	59.4	7.555	23.3
51	SV	FR	Sutter	79,400	0.233%	39.435	54.7	189.464	38.7	4.929	15.2
52	SV	TEH	Tehama	56,000	0.165%	27.813	38.6	133.627	27.3	3.477	10.7
57	SV	YS	Yolo	169,800	0.499%	84.333	116.9	405.176	82.8	10.542	32.6
58	SV	FR	Yuba	60,500	0.178%	30.048	41.7	144.365	29.5	3.756	11.6
	SV Total			2,347,700	6.897%	1,166.008	1,616.9	5,602.074	1,145.4	145.751	450.2
	Grand Total			34,039,835		16,906.211	23,444.2	81,225.745	16,607.8	2,113.276	6,527.1